DSM400
Digital Sounder Module

Installation Guide

Raymarine®

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Safety notices

Warning: Product installation

This equipment must be installed and operated in accordance with the Raymarine instructions provided. Failure to do so could result in poor product performance, personal injury, and/or damage to your boat.

Warning: High voltage

This equipment contains high voltages.

DO NOT remove the covers or access internal components unless instructed to do so within the product handbook.

NEVER remove the DSM400 cover when power is connected.

Warning: Power supply

Make sure the boat's power supply is set to OFF before starting to install this product. Unless stated otherwise only connect or disconnect this equipment with the power supply set to OFF.

Warning: Heavy object

The DSM400 Digital Sounder Module weighs 27 lbs (12.25 kg). Ensure that the chosen location for the unit is able to support the weight.

Take care when lifting or moving the unit.

Warning: Sources of ignition

This equipment MUST NOT be installed in hazardous/flammable atmospheres such as an engine room.

Warning: Transducer cable

Removing the transducer cable(s) from the unit while powered ON can cause sparks. Only remove a transducer cable after the unit has been powered OFF.

Warning: Operation

NEVER operate the sounder with the boat out of the water.

NEVER touch the transducer face when the sounder is powered on.

SWITCH OFF the sounder if divers are likely to be within 25 ft (5 m) of the transducer.

Caution: Mounting the unit

Due to the weight of the unit, it must be mounted using the bolts supplied. DO NOT use self-tapping screws as these will not support the weight.

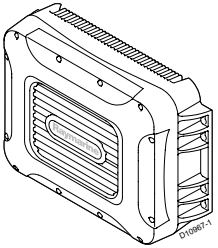
Caution: Service and Maintenance

This product contains no user service-able parts.

Important information

Introduction

Your Raymarine DSM400 is a 'black box' digital sounder module that provides full function fishfinding and sonar capabilities to Raymarine E-Series and G-Series systems.



Intended use

The intended use for your Raymarine DSM400 Digital Sounder Module is for leisure marine boats and workboats not covered by International Maritime Organisation (IMO) and Safety of Life at Sea (SOLAS) Carriage Regulations.

EMC conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the leisure marine market.

The design and manufacture of Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Declaration of conformity

Raymarine plc declare that the DSM400 Digital Sounder Module is in compliance with the essential requirements of EMC Directive 2004/108/EC.

The original Declaration of Conformity certificate may be viewed on the relevant product page at www.raymarine.com

WEEE Directive

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment. Whilst the WEEE Directive does not apply to some Raymarine products, we support its policy and ask you to be aware of how to dispose of this product.

The crossed out wheelie bin symbol, illustrated above, and found on our products, signifies that this product should not be disposed of in general waste or landfill.

Please contact your local dealer, national distributor or Raymarine Technical Services for information on product disposal.

RoHS Directive

This product uses components that comply with the Restriction of the use of certain Hazardous Substances (RoHS) Directive 2002/95/EC.

Conventions

Within this handbook the following conventions are used:

This symbol indicates a hint or tip.

This symbol indicates a note.

Warranty

To register your Raymarine DSM400 Digital Sounder Module ownership, please take a few minutes to fill out the warranty registration card found in the box, or visit www.raymarine.com and register on-line.

It is important that you register your product to receive full warranty benefits. Your unit package includes a barcode label indicating the serial number of the unit. You should stick this label to the warranty registration card.

Handbook

To the best of our knowledge, the information in this handbook was correct as it went to press. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and the handbook.

Chapter 1: Installation

1.1 Introduction

This chapter deals with the installation of the DSM400 Digital Sounder Module and covers the following:

- **EMC installation guidelines** - refer to page 9
- **Planning the installation** - refer to page 12
- **What's in the box** - refer to page 13
- **Installing the unit** - refer to page 13
- **Cable runs** - refer to page 14
- **Extending cables** - refer to page 15

Connections to the unit are dealt with in "System and transducer connections" on page 17.

1.2 EMC installation guidelines

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

Their design and manufacture conforms to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised. Although every effort has been taken to ensure that they will perform under all conditions. It is important to understand what factors could affect the operation of the equipment.

The guidelines given here describe the conditions for optimum EMC performance, but it is recognized that it may not be possible to meet all of these conditions in all situations. To ensure the best possible conditions for EMC performance within the constraints imposed by any location, always ensure the maximum separation possible between different items of electrical equipment.

- Place equipment at least 5ft (1.5 m) from any equipment transmitting or cables carrying radio signals, e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 7ft (2 m).
- Place equipment more than 7ft (2 m) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The equipment is supplied from a separate battery from that used for engine start. Voltage drops below 10 V and starter motor transients can cause the equipment to reset. This will not damage the

equipment, but may cause the loss of some information and may change the operating mode.

- Cables are not cut or extended unless doing so is detailed in the installation manual.

Remember

Where constraints on the installation prevent any of the above recommendations:

- Always allow the maximum separation possible between different items of electrical equipment. This will provide the best conditions for EMC performance for the installation.

1.3 Cable suppression ferrites

The DSM400 is supplied with a pack of suppression ferrites. These must be fitted correctly to ensure optimum EMC performance and to comply with applicable EMC regulations.

Fit the ferrites to the cables supplied as shown overleaf.

Additional cables and ferrites

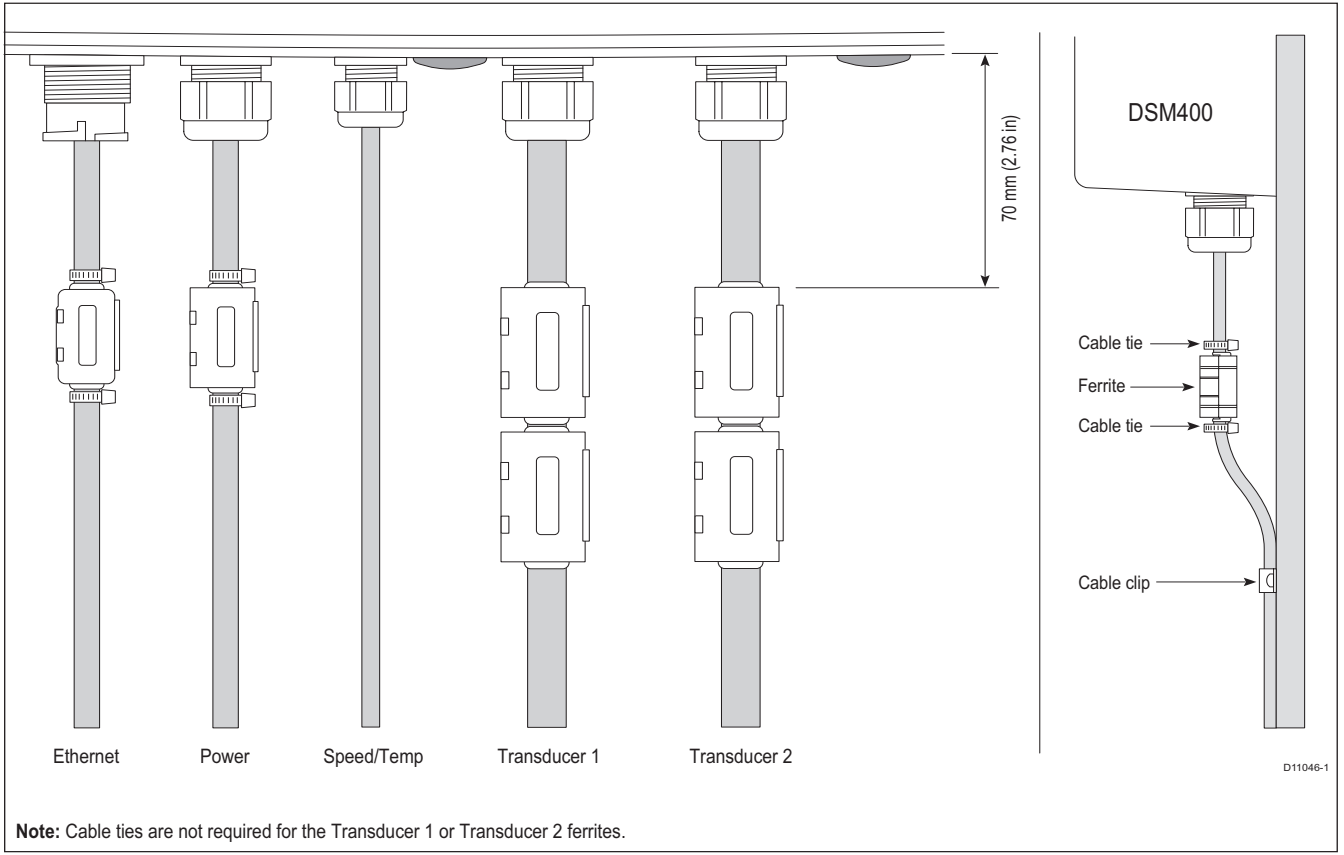
Additional cables fitted to the system will also require ferrites.

Use only ferrites of the correct type, supplied by Raymarine authorized dealers.

Connection to other equipment

If Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a Raymarine suppression ferrite MUST always be attached to the cable in a position near the Raymarine unit.

Cable suppression ferrite pack installation



Note: Cable ties are not required for the Transducer 1 or Transducer 2 ferrites.

1.4 Planning the installation

Warning: Product installation

This equipment must be installed in accordance with the instructions contained in this handbook. Failure to do so may result in poor product performance, personal injury, and/or damage to the boat.

Warning: Sources of ignition

This equipment must NOT be installed or used in hazardous/flammable atmospheres such as an engine room.

Warning: Heavy object

The DSM400 Digital Sounder Module weighs 27 lbs (12.25 kg). Ensure that the chosen location for the unit is able to support the weight.

Take care when lifting or moving the unit.

Caution: Mounting the unit

Due to the weight of the unit, it must be mounted using the bolts supplied. DO NOT use self-tapping screws as these will not support the weight.

Before installing the unit, consider the following:

- Location of the sounder module.
- Cable runs.
- Transducer selection.

Location of the sounder module

The unit should be mounted where it will be:

- protected from physical damage and excessive vibration.
- protected from prolonged exposure to rain, salt spray and direct sunlight.
- well ventilated.
- as close to the transducer as possible.

When choosing a location for the sounder module, consider the following points to ensure reliable and trouble free operation.

- **Access** - there must be sufficient space below the unit to enable cable connections to the unit, avoiding tight bends.
- **Interference** - the unit should be mounted far enough away from any device that may cause interference such as motors, generators and radio transmitters/receivers. See “EMC installation guidelines” on page 9.
- **Magnetic compass** - mount the unit at least 3 ft. (1 m) away from a magnetic compass.
- **Vertical surface** - the unit must be mounted in an upright position.

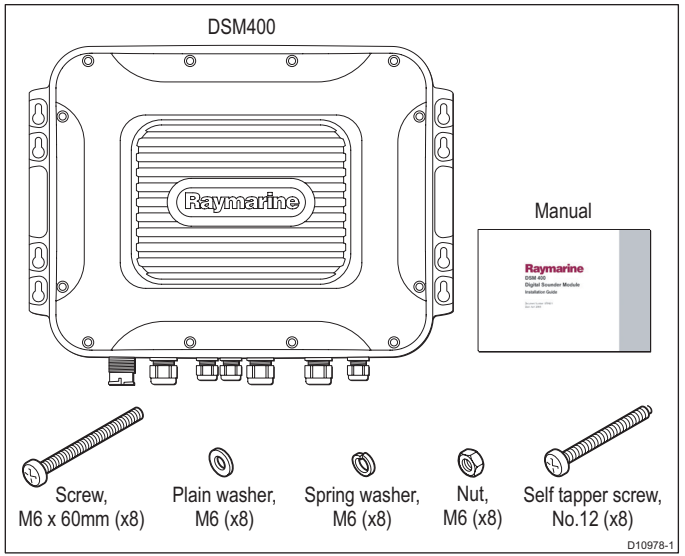
DO NOT mount the unit:

- in an engine room.
- on the main console.
- on a horizontal surface

1.5 What's in the box

Unpack the unit and associated components carefully to prevent damage. Save the box and packing in case the unit needs to be returned for service.

Check that all the correct system components are included as shown in the drawing below.



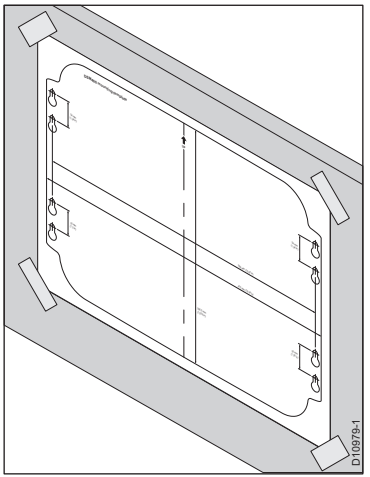
Not all cable glands are supplied fitted to the unit as shown above, but will be found loose in the components bag.

1.6 Installing the unit

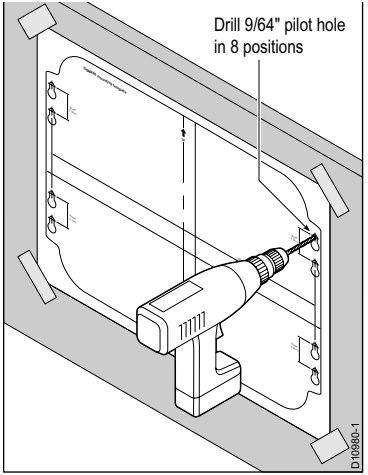
Having selected a suitable location, install the unit using the supplied hardware.

To install the unit:

1. Using tape, secure the mounting template in the required location.



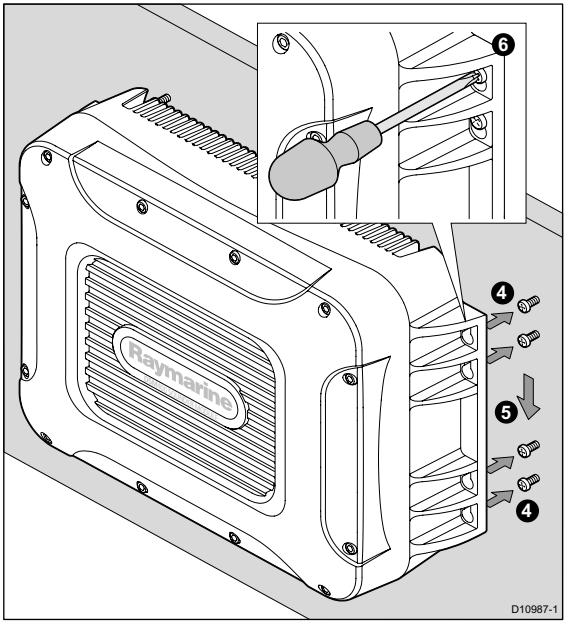
2. Drill a 9/64" pilot hole at each of the eight marked locations on the template.



Unit MUST be mounted in an upright position

For fiberglass mountings, countersink each of the pilot holes to prevent damage to the gelcoat when driving in the bolts.

3. Fix the mounting bolts into the eight holes.
4. Place the unit onto the mounting bolts.
5. Press the module downwards to engage the key slots in the unit.



6. Tighten the bolts to secure the unit in position.

1.7 Cable runs

Before installing the system cables, consider the following points:

- Power, transducer and network cables need to be attached to the unit.

- Cables should be adequately secured, protected from physical damage, and protected from exposure to heat.
- Avoid running cables through bilges or doorways, or close to moving or hot objects.
- Avoid sharp bends.
- Use a watertight feed-through wherever a cable passes through an exposed bulkhead or deckhead.
- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.

Power cable

The power cable should be run as a single length of cable from the unit to the boat's battery/distribution panel.

Please refer to the following table to ensure that the correct gauge of cable is used for the required cable length.

Cable length		Wire size	
Feet	**Metres**	**AWG**	**mm^2**
10	3	14	2.1
15	4.6	14	2.1
20	6	12	3.3
25	7.6	12	3.3
30	9	10	5.3

1. *The figures assume a constant current of 7A, regardless of input voltage.*
2. *Cable length is the distance between the power source and the unit.*
3. *These wire sizes give a total drop of about 0.5 V between the power source and the unit, achieving a minimum voltage at the unit of 10.5 V with a fully flat battery at 11V.*

Transducer cable

Raymarine does not recommend extending the transducer cable. However, if this is unavoidable contact your local dealer for assistance.

Chapter 2: System and transducer connections

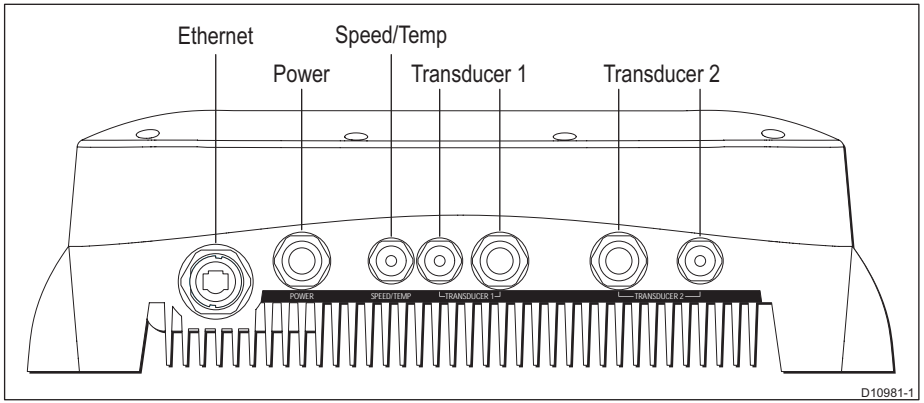
2.1 Introduction

This chapter deals with connecting the DSM400 Digital Sounder Module to the system and transducers to the unit and covers:

- **Unit connections** - refer to page 17
- **Transducer connections** - refer to page 18
- **Custom transducer configuration** - refer to page 19
- **Ultrasonic speed/depth transducer** - refer to page 21
- **DC power connection** - refer to page 21
- **Grounding the display** - refer to page 22
- **Connecting to a display** - refer to page 23

2.2 Unit connections

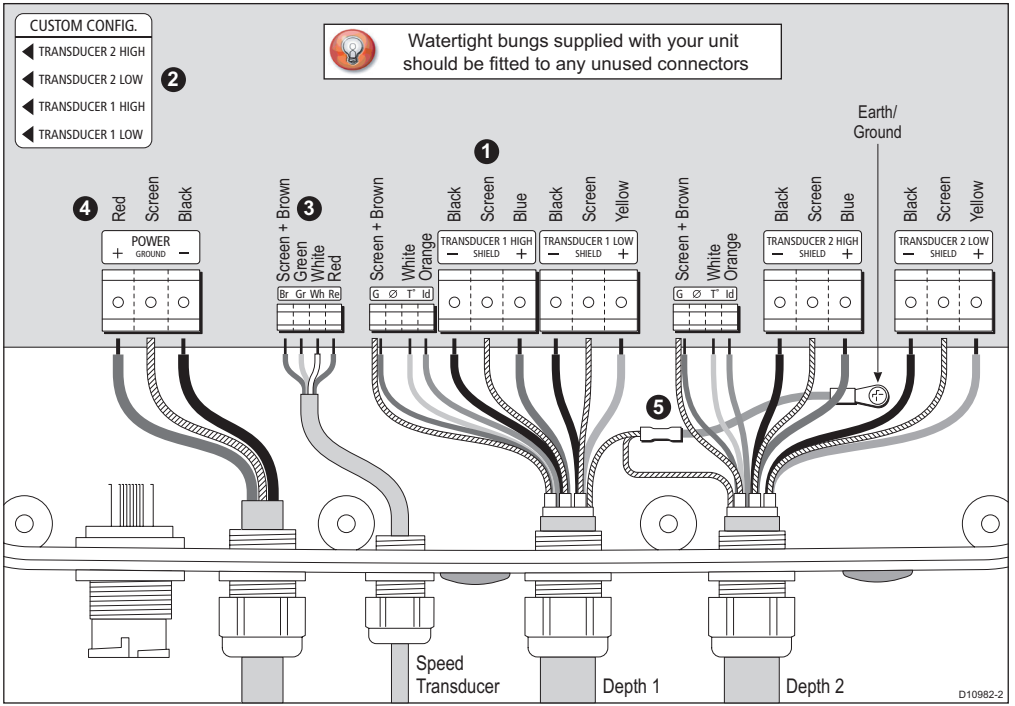
The unit connectors are located at the base of the unit as shown below:



2.3 Transducer connections

WARNING: Transducer cable
Removing the transducer cable(s) from the unit while powered ON can cause sparks. Only remove a transducer cable after the unit has been powered OFF.

The following diagram shows the layout of the transducer connections within your DSM400 Digital Sounder Module:

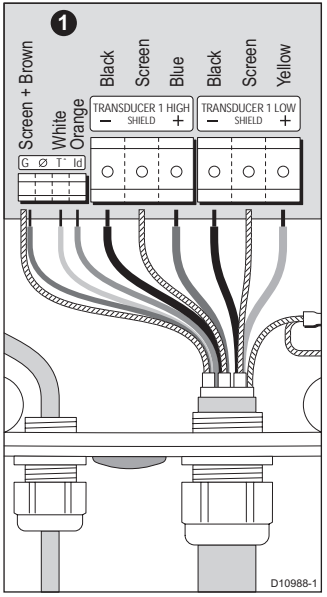


The numbers within the drawing refer to the detailed illustrations within this chapter.

Note: Only one temperature wire should be connected. (To either the speed/temperature or non-diplexed transducer input as appropriate.)

Non-Diplexed transducer cables

Non-Diplexed transducer cables contain wires bundled as detailed and should be connected within the sounder module as shown in the following diagram:

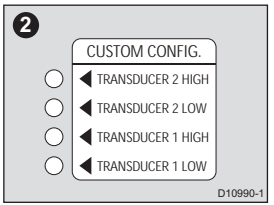


Bundle	Function
Blue/black/shield	High frequency +/-/shield
Yellow/black-and-white/shield	Low frequency+/-/shield
Brown/white/shield	Ground/temp/ground
Orange/shield	Transducer ID/Ground

The overall screen must be connected to the unit earth bolt using the ground spur cable supplied - refer to “Ground connection” on page 22.

2.4 Custom transducer configurations

If the cable connections for the transducer you are using with your DSM400 do not include an ‘Orange ID’ wire, you will need to configure the sounder unit manually to match the power and frequency of the transducer. To do this, use one of the four override rotary switches located on the left of the sounder unit printed circuit board (PCB).



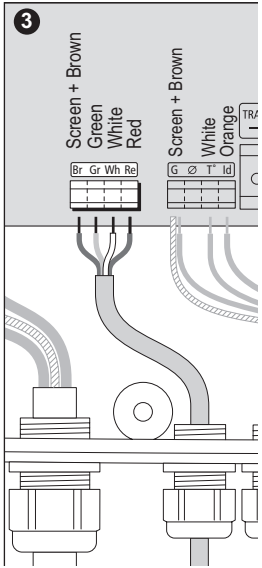
It is important that when you make a manual override to the configuration settings, make sure that you match the power and frequency settings exactly or you may damage the transducer.

The rotary switches have the following settings:

	High Frequency	**Low Frequency**
0	Override OFF (use Orange ID)	Override OFF (use Orange ID)
1	Disconnected (use Orange ID cable, but channel is disconnected)	Disconnected (use Orange ID cable, but channel is disconnected)
2	Reserved	Reserved
3	Reserved	Reserved
4	200 KHz/ 100 W	50 KHz/ 600 W
5	200 KHz/ 300 W	50 KHz/ 1 kW
6	200 KHz/ 600 W	50 KHz/ 2 kW
7	200 KHz/ 1 kW	50 KHz/ 3 kW
8	200 KHz/ 2 kW	38 KHz/ 600 W
9	185 KHz/ 100 W	38 KHz/ 1 kW
A	185 KHz/ 300 W	38 KHz/ 2 kW
B	185 KHz/ 600 W	38 KHz/ 3 kW
C	185 KHz/ 1 kW	28 KHz/ 600 W
D	185 KHz/ 2 kW	28 KHz/ 1 kW
E	Reserved	28 KHz/ 2 kW
F	Reserved	28 KHz/ 3 kW

2.5 Ultrasonic speed/temperature transducer

If you are installing a separate ultrasonic speed/temperature transducer, you should connect it to the sounder unit as shown in the following diagram:



Red	Positive
White	Temperature
Green	Speed signal
Screen and brown	Negative

2.6 DC power connection

WARNING: Power supply
Make sure the boat's power supply is set to OFF before starting to install this product. Unless stated otherwise only connect or disconnect this equipment with the power supply set to OFF.

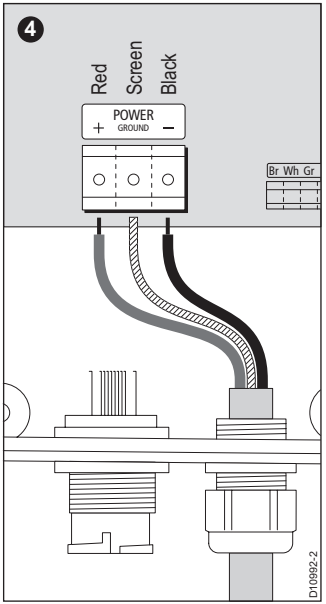
Your DSM400 Digital Sounder Module is intended for use on DC power systems rated from 10.7 V to 32V.

The power connection to the sounder unit should be made at either the output of the battery isolator switch or at a DC power distribution panel. Power should be fed directly to the sounder unit on a dedicated cable system and protected by a 5 amp thermal circuit breaker or quick-blow 10 amp fuse installed in the red ((positive) wire. The thermal circuit breaker or fuse should be connected as close to the power connection as possible.

There is no power switch on your sounder unit. The unit is powered when the power cord is attached to the boat's power

Locate the unit so that the power cord can be accessed and removed easily if necessary. If this is not possible, Raymarine strongly recommend that an ON/OFF switch is installed in the power cord where it can be easily accessed.

The DC power connections are shown in the following drawing:



Terminal	Function	Color
+	Battery positive	Red
Ground	Shield (drain wire)	No insulation
-	Battery negative	Black

2.7 Ground connection

Power input cable

Your DSM400 Digital Sounder Module is designed for use on boat's with a 'negative' ground system and is not intended for use on boat's with a 'positive' ground system.

It is important that an effective RF ground is connected to the system. A single ground point should be used for all equipment. You can ground the sounder unit by connecting the drain wire (shield) of the power input cable to the boat's RF ground.

If you need to extend the wire, the extension wire should be an 8 mm braid or AWG 10 multi-stranded cable. If your boat does not have and RF system, connect the drain wire to the negative battery terminal.

The boat's DC power system should be either:

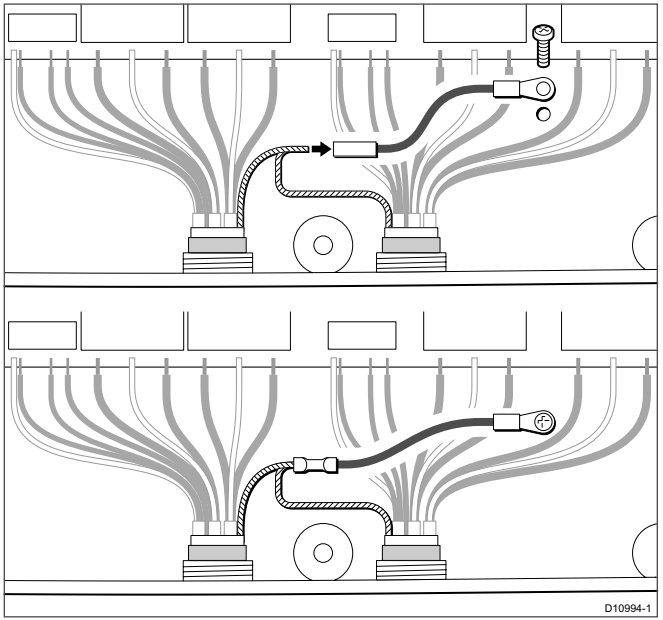
- Negative ground, with the negative battery terminal connected to the boat's ground, or,
- Floating, with neither battery terminal connected to the boat's ground.

Transducer cable

To ensure an efficient ground for the transducer cable(s) you should carry out the following:

1. Gather the external shield wires from the transducer cable(s) and twist the free ends together.
2. Insert these twisted ends into the connector of the ground spur.
3. Using a suitable tool, crimp the twisted ends into the ground spur connector.

4. Attach the ground spur to the ground screw on the body of the sounder unit.



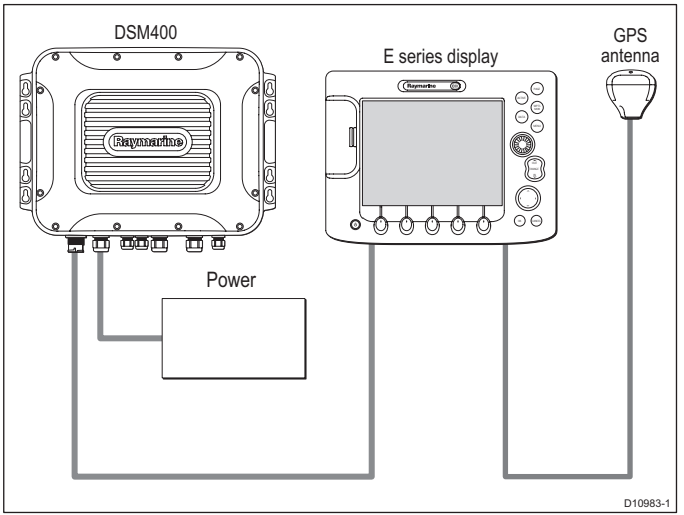
2.8 Display connection

Your DSM400 Digital Sounder Module can be connected to either E-Series or G-Series display units.

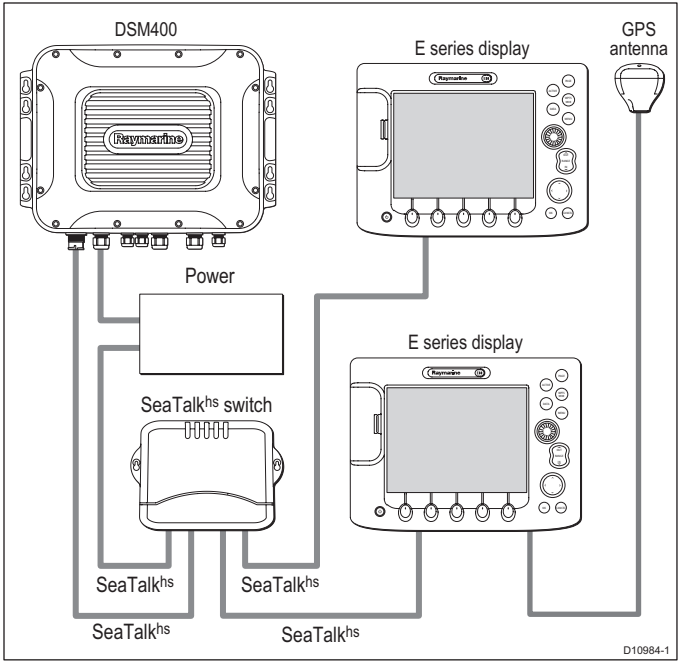
How you configure the sounder module depends on the type of display to which it is going to be connected. Full details will be found in the relevant documentation for your display.

Connections for both E-Series and G-Series displays are shown in the following diagrams:

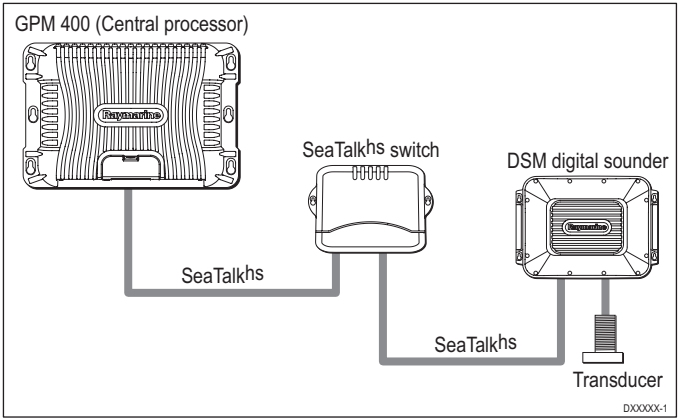
Connecting to an E-Series display



Connecting to multiple E-Series displays



Connecting to a G-Series system



Chapter 3: Maintenance and troubleshooting

3.1 Introduction

This chapter deals with maintenance and troubleshooting for the DSM400 Digital Sounder Module, and covers the following:

- Maintenance - refer to page 25
- Resetting the system - refer to page 27
- Troubleshooting - refer to page 28
- Warnings and errors - refer to page 30
- Thermocline troubleshooting - refer to page 29
- Contacting Raymarine - refer to page 31

Adjustments to this equipment requires specialized service procedures and tools only available to qualified service technicians. There are no user serviceable parts or adjustments.

3.2 Maintenance

WARNING: High voltage
This equipment contains high voltages. Unless otherwise instructed in this handbook DO NOT remove the covers or access internal components.

CAUTION: Service and Maintenance
This product contains no user serviceable parts.

EMC servicing and safety guidelines

- Raymarine equipment should be serviced only by authorized Raymarine service technicians. They will ensure that service procedures and replacement parts used will not affect performance. Raymarine products do not contain any user serviceable parts.
- Some products generate high voltages. Never handle cables or connectors when power is being supplied to the equipment.
- When powered all electrical equipment produces electromagnetic fields. These can cause adjacent items of electrical equipment to interact with one another, with consequent adverse effects on operation. To minimize these effects and enable best possible performance from the equipment guidelines are given in the installation instructions, to ensure minimum interaction between different

items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).

- Always report any EMC related problem to a Raymarine dealer. Such information is used to improve quality standards.
- In some instances it may not be possible to prevent the equipment from being affected by external influences. In general this will not damage the equipment but can lead to spurious resetting action, or may result in momentary faulty operation

Routine checks

The DSM400 Digital Sounder Module is a sealed unit. Maintenance is therefore limited to the following periodic checks:

- Examine all of the cables for signs of damage, such as chafing, cuts or nicks.
- Check that all cable connectors are firmly attached.

Cleaning

Cleaning the unit

The sounder module is a sealed unit and does not require regular cleaning. If it necessary to clean the unit, follow these basic procedures:

- Ensure the power is set to OFF.
- Wipe the module using a damp cloth.
- If necessary, use isopropyl alcohol (IPA) or a mild detergent to remove grease marks.

Cleaning the transducer

Sea growth can collect quickly on the bottom of the transducer which can reduce its performance in just a few weeks. To prevent the build-up of sea growth, coat the transducer with a thin layer of paint.

Use only water-based antifouling paint, or a water-based paint specifically designed for transducers. Apply the paint with a brush.

If the transducer becomes fouled or stops working because of sea growth or sand, use a stiff brush to clean it. The surface can also be sanded with a fine-grit wet or dry sandpaper (#320 grade or finer), but this will affect the performance of the unit when the boat is moving at higher speeds.

The paddle wheel mechanism may become jammed by dirt, grit or barnacles. Work the contaminant out of the mechanism, then clean the unit with soap and water or IPA.

Cleaning the hull

Take care when cleaning the outside of the hull near the transducer as harsh cleaning solvents such as acetone may damage the transducer.

3.3 Resetting the system

Using the reset function will return your DSM400 Digital Sounder Unit to its factory default values. The reset function also clears any sonar depth offset and speed and temperature calibrations that have been set.

To perform a factory reset:

1. On the display, make the **Fishfinder** window active.
2. Press **Menu**.
3. Select **Fishfinder Setup**.
4. Select **DSM Settings.**
5. Select **DSM Reset.**
6. The message **Reset DSM?** appears.
7. To confirm the reset, select soft key YES**,** or press **OK.**

   DSM powers OFF and ON, the LED will go from blinking green to solid orange (1 sec.)., the System Data Alarm will sound showing that connection to the DSM is lost.
8. Press the ACKNOWLEDGE soft key.

   After approximately 10 seconds the DSM will re-acquire data.
9. To complete the reset, read the warning and press **OK**.

To cancel the reset, either:

Before pressing YES (Step 7 above), either, press NO softkey**,** or, **CLEAR** button. The screen changes to show the Fishfinder DSM Settings.

Press **CANCEL** three times to return to the fishfinder application.

3.4 Troubleshooting

All Raymarine products are, prior to packing and shipping, subject to comprehensive test and quality assurance programs. However, if the unit develops a fault please refer to the following table to identify the most likely cause and the corrective action required to restore normal operation.

If there is still a problem after referring to the table, contact your local Raymarine dealer, national service agent or Raymarine Technical Services for further advice. Always quote the product serial number which can be found on the back of the unit.

Common problems and their solutions

Problem	Solution
Display freezes	1. Check that the scroll speed is not set to zero. 2. Check the transducer cable for damage. If damaged the cable and transducer must be replaced as a unit.
Sounder does not display fish	1. Fish arches are not displayed if the boat has stopped - fish will appear on the display as a straight line. 2. Ensure the transducer is within 10 degrees of vertical. 3. Check that the gain is not set too low.
Sounder does not see bottom or fish	1. Check that the gain is not set too low. 2. Ensure the transducer is within 10 degrees of vertical. 3. Check that the transducer face is not covered or fouled - If necessary clean the transducer. 4. Check the voltage from the power source. If it is too low it can affect the transmitting power of the sounder.
Sounder displays a lot of background noise	1. Check that the gain is not set too high. 2. Check that the transducer is mounted correctly and is clean.
Sounder temperature readings are wrong	If necessary, adjust the TEMP CALIBRATE parameter.
Sonar display is unreliable at high boat speeds	Turbulence around the transducer may be confusing the unit. Check the transducer location.

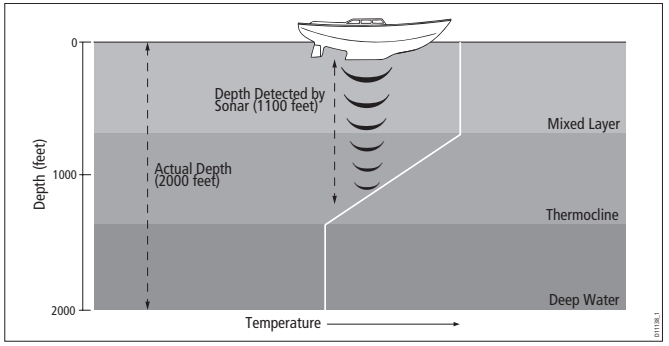
3.5 DSM400 Thermocline Troubleshooting

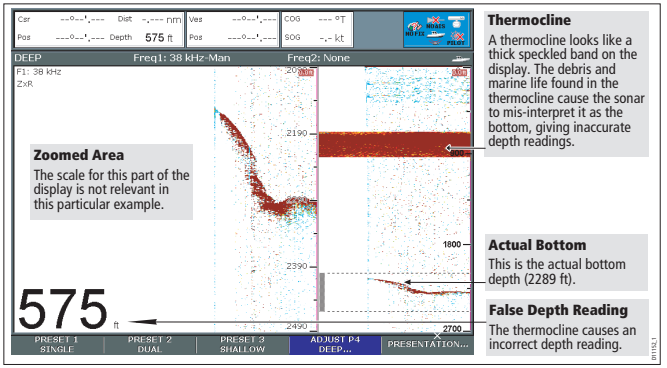
Thermocline Troubleshooting

This section describes how to troubleshoot incorrect depth readings caused by “thermoclines” in certain areas of water.

Thermocline Overview

In temperature terms, oceans can be thought of in different layers; a mixed layer and a colder deep layer, separated by a thermocline layer, where there is an abrupt change in temperature. The thermocline attracts additional marine life and small particles of debris, reducing the accuracy of fishfinder sonars, as shown below:




DEEP
Freq1: 38 kHz-Man
Freq2: None
F1: 38 kHz
Z>R
2190
1800
2390
2700
575 ft
PRESET 1 SINGLE
PRESET 2 DUAL
PRESET 3 SHALLOW
ADJUST P4 DEEP...
PRESENTATION...
Thermocline
A thermocline looks like a thick speckled band on the display. The debris and marine life found in the thermocline cause the sonar to mis-interpret it as the bottom, giving inaccurate depth readings.
Zoomed Area
The scale for this part of the display is not relevant in this particular example.
Actual Bottom
This is the actual bottom depth (2289 ft).
False Depth Reading
The thermocline causes an incorrect depth reading.

This problem occurs when fishfinder sonars (including the DSM400) interpret the thermocline as the bottom of the seabed, returning an incorrect depth reading. To overcome this problem, you must configure the DSM400 to operate in a different frequency range, using your Raymarine Multi-Function Display. This is described in the following procedures.

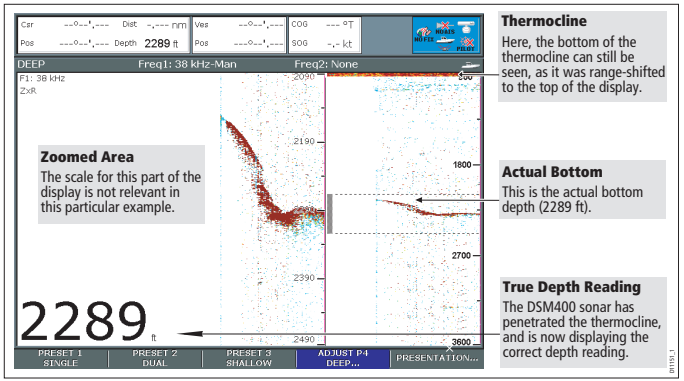
Using Low and High Frequencies

Before performing any of the procedures detailed on this page, it is important to understand the difference between low and high frequencies. The DSM400 features both low and high frequency transducers, enabling you to view low or high frequencies (or both) in the fishfinder display. *Low* frequencies (less than 100 Khz) scan a wide area and penetrate water well, and are suitable for displaying a large area below your boat, or in deep water. *High* frequencies (100 to 200 Khz) scan a narrow area but produce more detail, especially at high boat speeds. High frequencies are well-suited to shallow waters up to 1000 feet.

Achieving Accurate Sonar Readings

If you are using the DSM400 at depths of *less* than 100 feet, thermoclines are always penetrated correctly by the sonar, providing accurate depth readings. If you are using the DSM400 at depths *greater* than 100 feet, and displaying *low* frequencies only:

1. Press the **RANGE IN** or **RANGE OUT** button to open the Range Adjust toolbar.
2. Toggle the **RANGE** softkey to the **MAN** option.
3. Press **OK**.
4. In the main fishfinder view, press the **RANGE SHIFT** softkey.
5. Using the rotary control, adjust the range so that the true sea bottom and the thermocline return are displayed. Continue to adjust the range until the thermocline is shifted off the top of the screen, while the true bottom remains on the screen. The correct depth is then displayed, as shown in the following diagram:


Thermocline
Here, the bottom of the thermocline can still be seen, as it was range-shifted to the top of the display.
Zoomed Area
The scale for this part of the display is not relevant in this particular example.
Actual Bottom
This is the actual bottom depth (2289 ft).
True Depth Reading
The DSM400 sonar has penetrated the thermocline, and is now displaying the correct depth reading.
DEEP
Freq1: 38 kHz-Man
Freq2: None
2289
PRESET 1 SINGLE
PRESET 2 DUAL
PRESET 3 SHALLOW
ADJUST P4 DEEP...
PRESENTATION...

If you are using the DSM400 at depths *greater* than 100 feet, and displaying *high* frequencies only, the Range Shift function has no impact, as the high frequencies mean that it is less likely that a thermocline will be detected as a bottom *in any range*. However, in the event that a thermocline *is* mis-interpreted as the bottom, you must adjust the fishfinder display to show low frequencies only, and then use the Range Shift function to penetrate the thermocline. This procedure is described in the steps above.

If you are using a combination of the low and high frequencies (for example, using the split display function and/or one of the dual-frequency preset modes), you may be able to see the bottom correctly by range-shifting the low frequency part of the display. If the correct bottom depth is not returned, you may need to switch to low frequencies only, and then use the Range Shift function to penetrate the thermocline, as described above.

3.6 Warnings and errors

The status Light Emitting Diode (LED) on the top casing of the sounder module provides information on the status of the sounder module and notifies you of any problems within the unit.

The LED blinks the following colors:

- **Green** - shows the unit is operating normally.
- **Amber** - warns of a problem in the unit.
- **Red** - shows that there is an error in the unit.

The number of times the LED ‘blinks’ is a code which represents the errors or warnings shown in the table below. If there are multiple warnings or errors, the codes are given in a sequence with a 1.5 second pause between sequence strings.

For example, if the transducer sense fails and the network is not detected, the LED blinks amber once, pauses 1.5 seconds, blinks amber twice 0.5 seconds apart, pauses 1.5 seconds and then repeats the sequence until the problems are resolved or up to 10 minutes elapse.

Color	No. of blinks	Warning/error	Cleared every 10 mins
Amber	Solid	DSM has rebooted	No
Amber	1	Transducer sense failure	No
Amber	2	Network not detected *	No
Amber	3	High temperature warning	Yes
Amber	4	Contact Raymarine	
Amber	5	Contact Raymarine	
Amber	6	Contact Raymarine	
Amber	7	Contact Raymarine	
Amber	8	Contact Raymarine	
Red	1	Contact Raymarine	Yes
Red	2	Check Voltage Supply	Yes
Red	3	Contact Raymarine	
Red	4	Contact Raymarine	
Red	5	Contact Raymarine	

* After 30 seconds of no network activity, the sounder unit enters Standby mode; No sonar pings are emitted and no warnings or errors are output on the Status LED. Instead the LED will blink GREEN once every 10 seconds.

3.7 Contacting Raymarine

Using the website

For the latest information on Raymarine products visit the website at www.raymarine.com.

Click on the region that you are located in and go to the **Customer Support** page for links to:

- Finding the location of the nearest factory service and authorized dealer for your area.
- Register Raymarine products.
- Accessing handbooks in Adobe Acrobat TM format.
- Downloading software updates.
- Accessing the Raymarine solution database.

Click **Find Answers** to use the searchable solution database, or click **Ask Raymarine** to submit a question to Raymarine technical support staff. A reply will be sent by e-mail.

In the US

Parts and accessories

Many Raymarine parts and accessories can be obtained from your local authorized Raymarine dealer.

However, if you are not able to obtain your requirements from the dealer, contact Raymarine Technical Services at:

1-603-881-5200 ext. 2333

Technical Service is available Monday through Friday 4.00AM to 6.00PM Eastern Time.

Please have the Raymarine item or part number ready when calling if placing an order. If you are not sure which item is appropriate for your unit, you should contact the Technical Support Department to verify your requirements.

Technical Support

For technical support, call:

1-603-881-5200 ext 2444

Raymarine Technical Support Specialists are available to answer questions about installing, operating and troubleshooting all Raymarine products.

Product repair and service

In the unlikely event that your Raymarine unit should develop a problem, please contact your authorized Raymarine dealer for assistance. The dealer is best equipped to handle your service requirements and can offer timesaving help in getting the equipment back into normal operation.

In the event that repairs cannot be obtained locally, product service may also be obtained by returning the unit to:

Raymarine Inc.
Product Repair Center
21 Manchester Street
Merrimack, NH03054-44821

The Product Repair Center is open Monday through Friday 8.15 AM to 5.00 PM Eastern Time.

All products returned to the Repair Center are registered upon receipt. Should you wish to enquire about the repair status of the unit, contact the Product Repair Center at:

1-603-881-5200 ext 2118

Please have the unit serial number ready when you call. We will do everything possible to make the repair and return your unit as quickly as possible.

Worldwide

Please contact the authorized dealer in the relevant country as listed on the website at www.raymarine.com

In Europe

In Europe, Raymarine support, service and accessories may be obtained from your authorized dealer or by contacting:

Raymarine plc
Anchorage Park
Portsmouth
Hampshire
England
PO3 5TD

Tel: +44 (0) 23 9269 3611
Fax: +44 (0) 23 9269 4642

Technical Support

Raymarine Technical Services Department handles enquiries concerning installation, operation, fault diagnosis and repair.

To contact the Technical Helpdesk:

Tel; +44 (0) 23 9271 4713

Fax: +44 (0) 23 9266 1228

Parts and accessories

Raymarine parts and accessory items are available through your authorized Raymarine dealer. Please refer to the lists of component part numbers and optional accessories in the Installation chapter of this handbook and have the numbers ready when speaking with your dealer.

If you are uncertain about what item to choose for your Raymarine unit, please contact the Customer Services Department prior to placing an order.

Appendix A: Specifications

General

Approvals	
CE - conforms to	2004/108/EC (EMC) EN60945:2002
Size	16.36” x 12.07” x 4.92” (415.5 x 306.6 x 125 mm)
Weight	27 lbs (12.25 kg)
Mounting	Eight keyholed mounting tabs, mounting bolts Mount below decks, but not in engine compartment
Power	
Voltage	12 or 24 V DC - nominal 10.7 - 32 V - absolute range
Current	8 A peak (pinging), 0.5 A idle
Fuse	5 A
Environmental	
Waterproofing	Splash proof enclosure
Operating range	-10^{o}C to + 50^{o}C
Storage range	-20^{o}C to +70^{o}C
Humidity	up to 95% @ 35^{o}C non-condensing
Connections	Power 2 x depth transducer 1 2 x depth transducer 2 Speed/temperature transducer RJ-45 SeaTalk HS

Features

Output power	selected manually or automatically up to 2 KW RMS @ 185 KHz/200KHz selected manually or automatically up to 3 KW @ 50/38/28 KHz (depending upon connected transducers)
Frequency	28/ 38/ 50/ 185/ 200 KHz
Pulse length	100 μ sec. up 4 msec.
Maximum transmit rate	1580 pulses/min. @ 50' range
Gain	Auto or manual
Range scales	36 (at 10,000ft/3 km using 28/38 KHz transponder of 3 kW)
Range control	Auto, manual, range shift, dual range
Zoom size	x2, x3, x4, xR (User selectable)
A-Scope	Yes
Bottom lock	Yes
White line	Yes
Background color options	Classic-blue, classic-black, classic-white, sunburst, greyscale, copper, night vision
Scroll speed	Selectable (0-100%)
Variable range marker	Yes
Alarms	Anchor, arrival, battery, deep depth, MOB, off track, fish, shallow depth, temperature

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